AMENDMENTS TO THE CLAIMS

1-86 (Canceled)

87. (Currently amended) A method for assessing at least one quality parameter or at least one quantity parameter of a particle in a liquid material, said liquid material comprising particles having bound thereto or comprised therein at least one species of analytes in an amount of less than $1x10^6$ analyte detectable positions per particle,

comprising:

mixing the liquid material with at least one reagent material, said reagent material at least comprising a first targeting species capable of selectively and directly binding to an analyte position of said species of analytes said species of analytes having an amount of less than 1×10^6 analyte detectable positions per particle and a labelling agent, wherein said labelling agent is a compound capable of emitting, absorbing, attenuating or scattering electromagnetic radiation to result in the generation of a detectable electromagnetic signal, wherein the first targeting species and the labelling agent are directly or indirectly coupled to each other,

arranging a volume of a liquid material comprising at least part of the mixture of the liquid material and the reagent material in a sample compartment having a wall part defining an exposing area, the wall part allowing electromagnetic signals from the volume in the compartment to pass through the wall to the exterior,

exposing, onto an array of active detection elements, a representation of electromagnetic signals originating from said labeling agent having passed through the wall part from the ~~volume~~ sample in the sample compartment, so that the ratio of a linear dimension of the image on the

array of detection elements to the original linear dimension in the exposing domain is smaller than 20:1,

detecting the representation as intensities by individual active detection elements, the detection of the representation from a plurality of particles being detected simultaneously,

processing the intensities in order to identify representations of electromagnetic signals from the particles as distinct from representations of electromagnetic signals from background, and

obtaining the at least one quality parameter or at least one quantity parameter from the result of the processing; wherein the sample is at a standstill during the exposure of the electromagnetic signals onto the array of active detection elements.

88. (Previously presented) The method according to claim 87, wherein the particle is selected from the group consisting of cells, cell walls, bacteria, plasmodia, virus, prions, fragments of cell walls, fragments of bacteria, fragments of plasmodia, fragments of virus, fragments of prions, clusters of cells, clusters of bacteria, clusters of plasmodia, clusters of prions, macromolecules and beads.

89. (Previously presented) The method according to claim 88, wherein the particle is a bead, to which analytes are bound.

90. (Previously presented) The method according to claim 87, wherein the analyte is selected from the group consisting of proteins, polypeptides, peptides, lipids, carbohydrates, lipoproteins, carbohydrate-conjugated proteins, membrane constituents, receptors, genes, DNA,

RNA, fragments of proteins, fragments of polypeptides, fragments of peptides, fragments of lipids, fragments of carbohydrates, fragments of lipoproteins, fragments of carbohydrate-conjugated proteins, fragments of membrane constituents, fragments of receptors, fragments of genes, fragments of DNA, fragments of RNA, clusters of proteins, clusters of polypeptides, clusters of peptides, clusters of lipids, clusters of carbohydrates, clusters of lipoproteins, clusters of carbohydrate-conjugated proteins, clusters of membrane constituents, clusters of receptors, clusters of genes, clusters of DNA, clusters of RNA, and clusters of fragments.

91. (Previously presented) The method according to claim 88, wherein the analyte is bound to a cell membrane or cell nucleus membrane.

92. (Previously presented) The method according to claim 88, wherein the analyte is comprised in a cell.

93. (Previously presented) The method according to claim 92, wherein the analyte is comprised inside an organelle.

94. (Previously presented) The method according to claim 92, wherein the analyte is located on the surface of an organelle.

95. (Previously presented) The method according to claim 87, wherein the particles have bound thereto or comprised therein at least one species of analytes in an amount of less than $5x10^5$ analyte detectable positions.

96. (Previously presented) The method according to claim 87, wherein the particles have between 500 and 50,000 analyte detectable positions.

97. (Previously presented) The method according to claim 87, wherein the particles are cells selected from the group consisting of mammalian cells, insect cells, reptile cells, fish cells, yeast cells, and fungi cells.

98. (Previously presented) The method according to claim 87, wherein the particles are cells selected from the group consisting of blood cells, sperm cells, and bone marrow cells.

99. (Previously presented) The method according to claim 87, wherein the liquid material comprises at least two different species of particles.

100. (Previously presented) The method according to claim 99, wherein only one of the species of particles has bound thereto or comprised therein the species of analyte.

101. (Previously presented) The method according to claim 87, comprising binding at least two distinct targeting species to at least two distinct species of analyte and labelling the at least two distinct targeting species with two distinct labelling agents.

102. (Previously presented) The method according to claim 87, wherein one species of analyte is selected from the group consisting of Cluster of Differentiation markers, Epithelial

Membrane Antigen, Estrogen receptor α, Cytokeratin Human, Cytokeratin 7, Cytokeratin 20, Ki-67/PI, Phosphatidylserine, BCL2 Oncoprotein, soluble urokinase Plasminogen Activator Receptor, urokinase, a hormone bound to a receptor, a cell cycle related protein, a marker of apoptosis, and Green fluorescent protein.

103. (Previously presented) The method according to claim 87, wherein one species of analyte is selected from the group consisting of a chromosomal DNA sequence, a mitochondrial DNA sequence, a chloroplast DNA sequence, a mRNA sequence, a rRNA sequence, a nucleotide sequence comprising a single nucleotide polymorphism.

104. (Previously presented) The method according to claim 87, wherein one species of analyte is a cell cycle related protein.

105. (Previously presented) The method according to claim 87, wherein the analyte is a cell cycle related protein receptor.

106. (Previously presented) The method according to claim 87, wherein one species of analyte is a marker of apoptosis.

107. (Previously presented) The method according to claim 87, wherein the at least one species of analyte is a medical marker of a disease.

108. (Currently amended) The method according to claim 87, wherein the reagent material comprises more than one first targeting species, each of said more than one first targeting species being directed to a different analyte.

109. (Previously presented) The method according to claim 87, wherein the targeting species is an antibody directed to the analyte species.

110. (Previously presented) The method according to claim 87, wherein the targeting species is a nucleotide probe complementary to a sequence of an analyte species.

111. (Previously presented) The method according to claim 87, wherein the targeting species is an in situ hybridisation probe.

112. (Previously presented) The method according to claim 87, wherein the liquid material is selected from the group consisting of body fluids, milk, milk products, waste water, process water, drinking water, food, feed, mixtures of body fluids, mixtures of milk, mixtures of milk products, mixtures of waste water, mixtures of process water, mixtures of drinking water, mixtures of food, mixtures of feed, dilutions of body fluids, dilutions of milk, dilutions of milk products, dilutions of waste water, dilutions of process water, dilutions of drinking water, dilutions of food, dilutions of feed, extracts of body fluids, extracts of milk, extracts of milk products, extracts of waste water, extracts of process water, extracts of drinking water, extracts of food, and extracts of feed.

113. (Previously presented) The method according to claim 87, wherein the reagent material is selected from the group consisting of fluorescently labelled antibodies, and antibodies labelled with reactive molecules.

114. (Previously presented) The method according to claim 87, wherein the reagent material is selected from the group consisting of fluorescently labelled nucleotide probes, and nucleotide probes labelled with reactive molecules.

115. (Previously presented) The method according to claim 87, wherein the reagent material further comprises lysing agents and tissue fixative agents.

116. (Previously presented) The method according to claim 87, wherein the labeling agent is selected from the group consisting of fluorescence quenching agents, light absorbing agents, and fluorescence amplification agents.

117. (Previously presented) The method according to claim 87, wherein the labelling agent is selected from agents giving rise to one or several of the following phenomena: attenuation of electromagnetic radiation, photoluminescence when illuminated with electromagnetic radiation, scatter of electromagnetic radiation, raman scatter.

118. (Previously presented) The method according to claim 117, wherein the labelling agent is selected from the group consisting of fluorescein, phycoerythrin, R-phycoerythrin,

cyanine dyes, acridine orange, thiazole orange, DAPI, propidium iodide, ethidium iodide, 7-aminoactinomycin D, and Per CP.

119. (Previously presented) The method according to claim 87, wherein the recording of image comprises the use of a confocal scanner.

120. (Previously presented) The method according to claim 87, wherein the image is recorded using an array of detection devices.

121. (Previously presented) The method according to claim 87, wherein the image is recorded using a CCD, a CMOS, a video camera or a photon counting camera.

122. (Previously presented) The method according to claim 87, wherein the image is recorded so that the linear dimension of the image on the array of detection elements is equal to the original linear dimension in the exposing domain.

123. (Previously presented) The method according to claim 87, wherein the enlargement ratio is below 10.

124. (Previously presented) The method according to claim 87 wherein the image is recorded in one exposure.

125. (Previously presented) The method according to claim 87 wherein the image is recorded in more than one exposure.

126. (Previously presented) The method according to claim 125, wherein the assessment of the number of particles is obtained on the basis of more than one image.

127. (Previously presented) The method according to claim 125, wherein information about the changes in the image in course of time is used in the assessment of the number of particles.

128. (Previously presented) The method according to claim 87, wherein a distinction between at least two spectral properties of a labelling agent is used to obtain the at least one quality parameter or at least one quantity parameter of the particles.

129. (Previously presented) The method according to claim 87, wherein the recording of an image further comprises exposing a first surface of the sample directly with excitation light from a first light means having at least a first light source, by use of focusing means detecting a fluorescence signal from the first surface of the sample onto a first detection means comprising at least a first detector.

130. (Previously presented) The method according to claim 102, wherein the Cluster of Differentiation marker is selected from the group consisting of CD3, CD4, CD8, CD16, CD19, CD22, CD34, CD45, CD61, and CD91.

131. (Previously presented) The method according to claim 104, wherein the cell cycle related protein is selected from the group consisting of cycline, tumor suppresser protein, Epidermal Growth Factor protein, Transforming Growth Factor beta, and Ki-67 protein.

132. (Previously presented) The method according to claim 131, wherein the cycline protein is cyclin D1.

133. (Previously presented) The method according to claim 131, wherein the tumor suppresser protein is p53 protein.

134. (Previously presented) The method according to claim 105, wherein the cell cycle related protein receptor is an Epidermal Growth Factor Receptor.

135. (Previously presented) The method according to claim 105, wherein the cell cycle related protein receptor is a Cyclin Dependent Kinase.

136. (Previously presented) The method according to claim 106, wherein the marker of apoptosis is selected from the group consisting of membrane bound phosphatidylserines, phosphatidylserines targeted with Annexin V, and BCL2 oncoprotein.

137. (Previously presented) The method according to claim 112, wherein the body fluid is selected from the group consisting of blood, urine, saliva, bile, sperm, faeces, cerebro-spinal fluid, nasal secrete, tears, and bone marrow.

138. (Previously presented) The method according to claim 116, wherein the fluorescence amplification agent is fluorescyl-tyramine or Cy3-tyramine.

139. (Previously presented) The method according to claim 118, wherein the cyanine dye is selected from the group consisting of Cy3, Cy5, Cy5.5, allophycocyanines, indotrimethinecyanines and indopentamethinecyanines.

140. (Previously presented) The method according to claim 87, wherein the ratio of a linear dimension of the image on the array of detection elements to the original linear dimension in the exposing domain is equal to no more than 4.